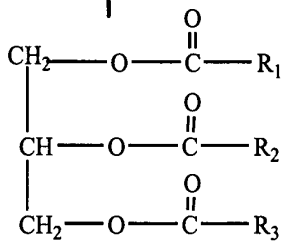
CLAIMS

1. A dielectric fluid comprising one or more vegetable oils and an antioxidant compound.

2. The dielectric fluid of claim 1 wherein said vegetable oil comprises a triglyceride of the formula:



wherein R_1, R_2 and R_3 each, independently, is an alkyl or alkenyl group that may be straight-chained or branched, may be saturated or unsaturated, and may be unsubstituted or may be substituted with one or more functional or non-functional moieties.

3. The dielectric fluid of claim 1 wherein said vegetable oil comprises one or more fatty acid molecules that include at least one degree of unsaturation.

4. The dielectric fluid of claim 1 wherein said vegetable oil comprises one or more fatty acid molecules selected from the group consisting of: myristic, palmitic, stearic, oleic, linoleic, linolenic, arachidic, eicosenoic, behenic, erucic, palmitiolic, docosadienoic, lignoseric, tetracossenoic, margaric, margaroleic, gadoleic, caprylic, capric, lauric, pentadecanoic, and heptadecanoic acids.

5. The dielectric fluid of claim 1 wherein said vegetable oil has an open-cup fire point of greater than 300 °C.

6. The dielectric fluid of claim 1 wherein said vegetable oil has a viscosity between about 2 and about 15 cSt at 100 °C and less than about 110 cSt at 40 °C, and has a specific heat of greater than about 0.3 cal/g-°C.

7. The dielectric fluid of claim 1 wherein said vegetable oil is a food grade vegetable oil.

8. The dielectric fluid of claim 1 wherein said dielectric fluid comprises a blend of two or more vegetable oils.

9. The dielectric fluid of claim 1 wherein said dielectric fluid comprises a blend of one or more vegetable oils and no more than about 30 percent by weight of a mineral oil.

10. The dielectric fluid of claim 1 wherein said antioxidant compound is selected from the group consisting of: butylated hydroanisole, butylated hydrotoluene, tertiary butylhydroquinone, tetrahydrobutrophenone, ascorbyl palmitate, propyl gallate, and alpha-, beta- or delta-tocopherol.

11. The dielectric fluid of claim 1 further comprising a pour point depressant.

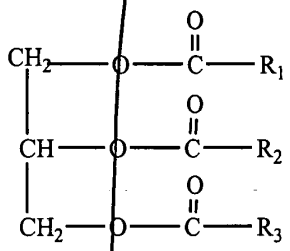
12. The dielectric fluid of claim 1 further comprising a dye or pigment.

13. A dielectric fluid comprising one or more vegetable oils and a pour point depressant.

14. The dielectric fluid of claim 13 wherein said pour point depressant is selected from the group consisting of: polyvinyl acetate oligomers, polyvinyl acetate polymers, acrylic oligomers, acrylic polymers, and mixtures thereof.

15. A method of using an electrical device comprising employing a dielectric fluid comprising at least one vegetable oil, wherein said vegetable oil is substantially free of chlorinated compounds.

16. The method of claim 15 wherein said vegetable oil comprises a triglyceride of the formula:



wherein R_1, R_2 and R_3 each, independently, is an alkyl or alkenyl group that may be straight-chained or branched, may be saturated or unsaturated, and may be unsubstituted or may be substituted with one or more functional or non-functional moieties.

17. The method of claim 15 wherein said vegetable oil comprises one or more fatty acid molecules that include at least one degree of unsaturation.

18. The method of claim 15 wherein said vegetable oil comprises one or more fatty acid molecules selected from the group consisting of: myristic, palmitic, stearic, oleic, linoleic, linolenic, arachidic, eicosenoic, behenic, erucic, palmitiolic, docosadienoic,

lignoseric, tetracossenoic, margaric, margaroleic, gadoleic, caprylic, capric, lauric, pentadecanoic, and heptadecanoic acids.

19. The method of claim 15 wherein said vegetable oil has an open-cup fire point of greater than 300 °C.

20. The method of claim 15 wherein said vegetable oil has a viscosity between about 2 and about 15 cSt at 100 °C and less than about 110 cSt at 40 °C, and has a specific heat of greater than about 0.3 cal/g-°C.

21. The method of claim 15 wherein said vegetable oil is a food grade vegetable oil.

22. The method of claim 15 wherein said dielectric fluid comprises a blend of two or more vegetable oils.

23. The method of claim 15 wherein said dielectric fluid comprises a blend of one or more vegetable oils and no more than about 30 percent by weight of a mineral oil.

24. The method of claim 15 wherein said dielectric fluid further comprises an antioxidant compound.

25. The method of claim 24 wherein said antioxidant compound is selected from the group consisting of: butylated hydroanisole, butylated hydrotoluene, tertiary butylhydroquinone, tetrahydrobutrophenone, ascorbyl palmitate, propyl gallate, and alpha-, beta- or delta-tocopherol.

26. The method of claim 15 wherein said dielectric fluid further comprises a pour point depressant.

27. The method of claim 15 wherein said dielectric fluid further comprises a dye or pigment.

28. The method of claim 15 wherein said device is an electrical transformer.

29. The method of claim 15 wherein said device is an electrical switchgear device.

30. The method of claim 15 wherein said device is an electrical transmission cable.

31. A device for generating or distributing electrical energy comprising:

(1) means for generating or distributing electrical energy; and

(2) a dielectric fluid comprising one or more vegetable oils that are free of chlorinated compounds.

32. The device of claim 31 further comprising an oxidation reducing composition enclosed in a housing composed of a polymeric material that is substantially permeable to oxygen, wherein the oxidation reducing composition is in contact with a headspace defined by the dielectric fluid.

33. The device of claim 32 wherein said oxidation reducing compound comprises one or more compounds selected from the group consisting of: sodium sulfite; copper

sulfate pentahydrate; a combination of carbon and activated iron powder; mixtures of hydrosulfite, calcium hydroxide, sodium bicarbonate and activated carbon; a metal halide powder coated on the surface of a metal powder; alkali compounds; sodium carbonate and sodium bicarbonate; and mixtures thereof.

34. The device of claim 32 wherein said oxidation reducing compound comprises iron oxide.

35. The dielectric fluid system of claim 1 wherein said polymeric material has an oxygen permeability of greater than or equal to 2,000 cc-mil/100 in^2•24 hrs•atm.

36. The dielectric fluid system of claim 1 wherein said polymeric material is polymethylpentene.

37. The dielectric fluid system of claim 1 wherein said polymeric material is selected from the group consisting of polyolefins and copolymers of polyolefins, polyphenylene oxide, polyethersulfone, nonwoven materials, and cellulose pressboards.

38. An electrical device including a tank for holding a dielectric fluid wherein said fluid comprises one or more vegetable oils that are free of chlorinated compounds.